

Participatory Design in children's diet:

Strategies to design public services

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Abstract

This paper aims to show a project carried out by a student of the Design Master's at Universidade de Aveiro, which consists of a Food Diary supported by a ludic and pedagogical kit implemented in 1st grade schools.

Western lifestyles have had several consequences in Public Health, particularly in children's diets. With this project we intended to demonstrate the role of design in the development of a social project, in its ability to design in a participatory way and in its ability to change behaviours, in particular, children's food behaviours. The methodology applied has its roots in participatory design, thus the conceptual process was undertaken collaboratively with a diverse team of professionals, several institutions in the region and the children themselves, being the designer a mediator between their different contributions.

In its results, we would like to highlight the positive impact of this project in the children involved, who through the Kit's usage, became aware of the unhealthy diet available to them, both at school and at home, and started demanding from their parents' and the schools cooks' healthier alternatives.

It is our belief that this project could be implemented as a public service, in health or education sectors.

Context

The project "What we eat" arises from the need, identified by social services of the Aveiro City Hall, to intervene at the level of eating habits in children, sensitizing them to the importance of healthy practices in their development as human beings.

According to the National Network of Responsible Consumers (Rede Nacional de Consumo Responsável - ISU and Reviravolta, nd), United Nations Food and Agriculture Organization (FAO) data for the 2001-2003 period show that there are about 850 million worldwide people suffering from malnutrition, which triggers health complications. Selah Hennes (2010) wrote in an article for the newspaper Voice of America, and quoted by the World Food Programme (2010), that in 2010 there were 925 million people affected by malnutrition - insufficient intake of calories to meet minimum physiological needs -, which means that one in seven people do not have enough food to have an healthy and have active life. In this scenario, children are the main victims, with 5 out of the 10.9 million malnourished children living in Asia, 26% in Africa and 4% in the Caribbean and Latin American (and ISU Reviravolta, nd). Paradoxically, despite the undernourished millions in the world, the

world's population is gaining weight rapidly (Penn, 2008). The unhealthy and unsustainable lifestyles in the urban environment of the western industrialized countries is one of the main problems in these societies. They are characterized by fast-paced rhythm, stress, the abundance of take away fast food services, and are associated with huge and unsustainable food systems (Kenner, 2008).

A report from the Portuguese Ministry of Health released in 2006 stated that programs promoting healthy eating and physical activity so as to prevent diseases are key instruments to meet development goals.

To develop the project, some case studies were analysed, one of them being the Apetece-me (A Craving for) Program, which is an educational program targeted at schools, implemented and in operation since 1999.

The program is intended to help change eating behaviours by providing teaching materials for teachers of 1st, 2nd and 3rd cycles of basic education. The information is provided in folders containing a dossier for the teacher and some leaflets on the importance of breakfast to the pupils. Although very important, this program is address to teachers.

Another example is Amigos Hortícolas (Horticulture Friends), which is a project implemented in a kindergarten and a 1st cycle school. This project stemmed from the perception that among young people there is a reduced consumption of vegetables; it is structured in four levels of action: to know, to appreciate, to ingest and to enjoy eating. The work done over the course of one year has been compiled into an e-book, with the aim of making the memory endure for children and other participants . In addition to reporting the whole project and disseminate the work of students, this book also deals with some educational content.

After examining several case studies and carrying out an in-depth research on eating habits, it was necessary to establish a methodology for developing the project.

The methodology applied has its roots in participatory design, thus the conceptual process was undertaken collaboratively with a diverse team of professionals, several institutions in the region and the children themselves, the designer being a mediator between their different contributions.

In fact, in this project design assumed, clearly, the role of strategist in it's conception and implementation. Since the beginning designers took the initiatives to set out how to determine what were

the ideal partners to contact, the products and services necessary for their correct implementation, the communication strategy to be developed and was also responsible for the coordination between all the partners - scheduling and leading meetings between them, making timely progress reports and promoting the gathering of suggestions for the necessary adjustments to the ultimate success of the initiative.

To this end, in an early stage ethnographic methods for collecting data were used and, later, collaborative design tools were used in order to engage the required expertise in the conception of the service, such as nutritionists, psychologists, nurses, teachers, technical staff from schools and city hall technicians.

However, the collaborative process does not seem to be easy and much less free of frustrations. According to Camponeschi (2010), there must be sufficient openness to achieve mutual understanding and the ability to cooperate, but simultaneously reserve the necessary distance for the production of novelty to happen. If the Design management is not successful, the collaborative process can be time consuming and inefficient (Camponeschi, 2010). Designers are in a unique position to help solve complex social and economic problems that affect us today; co-production may be the key to enable participatory design on these issues and to empower communities to find solutions (Design Council et al., 2006). The benefits that can arise from a change in behaviours and in our cities are many and therefore it is important that more professionals cooperate in the construction of alternative paths. Thus, a major challenge for cities' today - and a major challenge for the Design discipline - is to promote a new idea of public life, joining the communities and encouraging social urban innovations spanning all areas of life, from economics to personal welfare and community (Camponeschi, 2010).

The Project

Brief

The Aveiro City Council wanted to develop an original and innovative social intervention project that would have an impact not only in school-age children, but also on the various elements of their households.

The proposed program was based on the following points:

- a social project oriented to Aveiro's community, in particular two specific districts of the region, Santiago and Griné;

- theme: **Healthy Eating;**
- children were listed as potential users of the project, while schools were suggested as possible spaces for intervention; nonetheless, what was actually intended was to interact with the local community in their environment.

Development process

First proposals

1 | The first proposal presented to the Aveiro City Council was a food diary containing information about healthy eating. Based in other projects and in the researched information about children's education for health, we decided to have a playful approach, where the act of diary filling-in as a game. In this sense, we proposed a stickers' collage in a symbiosis with the sticker books and children's illustrated storybooks.

To transform the individual game into a collective one, to foster a greater commitment of each student with the collective involvement, we suggested a weekly comparison of individual data.

2 | Along with this project, a second hypothesis was presented, more aimed at involving the local community and local businesses: one initiative that involved grocery stores located in the intervened boroughs and that proposed to make information on healthy eating and healthy food available for them to give away with each purchase made. The purposes of this project were:

- to inform the local community about nutrition related issues;
- to give a boost to local businesses and improve visibility for local fresh goods' points of sale.
- promote the acquisition of healthy foods;
- promote a change in bad eating behaviours.

Between these two approaches, the first was the selected one, not only because the project's feasibility was higher, but also because it responded better to the client's goals.

The project's conception included a series of meetings between the various team members and several gatherings with the project's recipients, to ensure their involvement and co-participation in the solution. A team of experts in the fields of Nutrition, Psychology and Public Health was assembled, in order for it to guide the kit's construction and the design of the service.

The design of the system was the most participated part of the project, as it demanded the intervention of most of the entities involved.

Playfulness approach

Lopes (2005), author of the book "Human playfulness," advocates the use and utility of playfulness as a support, an educational and transformational vehicle.

In parallel, according to Gioca (2001), the studies of Piaget (1994) demonstrate the importance of playfulness for human development: There are several types of games that accompany the stages of children development, and it is between the age of 7 and 11 - the period of concrete operational thinking - that the game of rule begins, whose manifestation usually commences at the age of 4. In the rules' game the pleasure comes from the result obtained in complying with pre-established rules within a competitive environment, which allows the child to self-regulate and evaluate. Although this is a 'childish' game, this recreational activity extends to the whole of life.

Once a healthy diet is based on a set of rules, it seems coherent to carry recommended eating behaviours to the game's context, not only because it facilitates empathy for the subject and support behavioural changes, but also because it associates a pleasurable feeling (for the success in the game) to having a healthy lifestyle. On the other hand, the game not only informs the child but gives her/him a sense of autonomy: the child alone will realize the quality of her/his food and learn to balance it. In short, if the teaching materials used in early childhood education are entertaining, the possibilities of cognitive and emotional development of children are higher.

To give a "face" to the project and serve as a vehicle of communication with children, a mascot was designed- the little tummy monsters. This strategy was employed following a playful approach to enhance and create a relationship of affection. During the development of the illustrations, the need to give two hands to the mascot to facilitate the interaction with the other elements became evident.

The psychologist suggested the use of positive references, instead of negative ones, and the mascots were illustrated as "little monsters" that "love to learn how to be healthy".

To emphasize the positive approach and solve the question of the storyteller in the Students' Food Diary, a second character was created, corresponding to a hero - a Super little tummy monster that, on the account of being so healthy, gained magical powers. This hero takes care of the other little monsters and also the children, teaching them the tricks of a healthy everyday, helping them to change their behaviour.

The Students' Food Diary is divided in two main parts: the informative one and the ludic one. The contents of the first part were taken from a set of documents provided by the nutritionist and structured with her help. The order of the topics was as follows: **Healthy day-life - Food Wheel - Food Groups - The 6 Daily Meals - Exercise - Hygiene.**

Consistent with the playful approach and the psychologist's opinion and after being reviewed by the team, the contents were translated into a narrative similar to fairy tales, where conversations take place between the mascots, the hero and the reader.

The story begins with the mascots' presentation and an invitation for the children to participate in the game: the hero also asks the reader if he wants to become a hero, to help him care for and protect the mascots. To achieve this, the player must pass the Heroes Training - informative part of the food diary - and the final test, the Tummy's' Game.

The kit components

There are three main objects that support the project: the students' food diary, the class dashboard and the teacher's diary.



fig1 - the students' food diary

Students' food diary

An educational book with a strong entertainment character, in A5 format with spiral binding and recycled paper, which combines an illustrated children's book with a stickers booklet. It is divided in two parts: an informative one and another with an interactive game.

It has the main goal of informing, sensitizing and engaging children in healthy everyday habits, mainly through an accessible and relaxed language, reporting on diverse themes related with personal care and food habits. It also allows the children to have a clear perception of what they eat, easing the process of auto-

mous learning of food dosage, encouraging the consumption of healthy foods, the practice of a balanced and varied diet and engaging in healthy lifestyles.



Fig.2 - The mascots Zic and the hero Nai.

The Zic's, little tummy monsters, and the hero Nai help involving children's in the "tummy game". Nai appeals to the children's sense of responsibility, by asking them if they also want to be heroes and help him to protect the Zic's. At this stage the child fills a personal information page and paints a drawing of the hero with is favourite colours.



Fig. 3 - "The Heroes Training" introductory page.

The first part of the diary begins with The Heroes Training. From now on a dialog about everyday life and healthy eating is developed between the mascots, the hero and the children. Basically they are being prepared for "The Tummy Game".



Fig. 4 - “the five magic tricks” example page.

It presents the five magic tricks to a healthier and happier daily life.



Fig. 5 - “The Food Wheel” introductory page.

The wheel is presented with a high chromatic contrast and it explains how and why the food is divided.



Fig. 6 - the food information pages.



Fig. 7 - “the six daily meals” example page.

In this section the importance of each meal of the day and what should be eaten in each one is explained.



Fig. 8 - “the physical exercise” page.

In this second theme concerning the daily habits presented in the diary, are described the benefits of regular physical activity, while the mascots exemplify healthy activities that children can experience.



Fig. 9 - “the personal hygiene” page.

This topic was addressed with particular care in order to avoid embarrassment in children. It explained the importance of regular daily care, including washing hands, teeth and bathing.



Fig. 10 - “The Tummy Game” example pages.

This is where children learn the rules of the game, its purposes and where they should record their daily diet in order to see whether it is healthy or if they need to improve it.



Fig. 11 - “The final results” page.

Here the relationship between the colour of the stars and the health status of the mascot is highlighted, completed with some advices and short phrases of celebration and encouragement. After that follows the farewell of Nai and a page dedicated to the final score of the heroes training.



Fig. 12 - "The class dashboard" in use

The class dashboard

On this board each student will paste a sticker with a cartoon mascot painted by themselves and with their identification at the top of the table. Then he will fill his column in the panel at the weekly reflection session: the sum of the stars that the student achieved during the week will represent one final bigger star that he pastes to the Panel.

It is through this board that the game becomes collective, creating a dynamic classroom where the performance of individual results is displayed and compared. This activity aims to promote a healthy competition that motivates and drives the children in the search for improvement of daily habits.



Fig. 13 - "The teacher's diary" in use

The teacher's diary

This diary aims to register the activity of the class, through the data recorded in the Class dashboard and teachers' notes for further data collection and evaluation, to offset the inability to collect the diaries of children.

It results from a symbiosis between a calendar and a folding that allows three different, parallel and transverse readings: the week performance of the entire class, the students' progress throughout the project and the evolution of the class throughout the entire process.

Implementation

This was a one-year pilot project in order to fine tune strategies and materials for the project to become truly useful to the community involved. From the project's evaluation - carried out through the teachers' diary, the testimonies of those involved, the surveys completed by students at the beginning and end of the project - it was planned to detect faults and their correction, to continue the project.

Events



Fig. 14 - The poster for the “Choose the the name of the mascot” contest

The event kicked off with the competition “Choose the Name of Our Mascot”, on the same day as the World Food Day. The dialogue with children was done through a theater play, and the invitation to classes to participate in the contest was extended to all.



Fig. 15 - Teachers' and students' involvement in the project with activities they proposed.

Teachers' Training

Training sessions directed at the teachers, class monitors and other education professionals (working in Leisure Time occupational centres and for children and other children' institutions). The objectives behind this initiative were to raise awareness amongst the teaching professionals, to make available to them the necessary information and to clear some doubts, in order to ensure that the message passed on to the children was as uniform and consistent as possible





Fig. 16 - the student's receiving and completing the diary

Distribution of the Zic and Nai kits in schools

The visit to schools allowed:

- to track children's interaction with the game;
- to assess other activities that the classes developed on their own about themes raised by the Food diary;
- To partially understand the results obtained through the initiative;
- to ascertain with the teachers and the children the projects' up-side and downside aspects;
- to gather improvement suggestions;
- to talk with children and introduce them to some of the people that took part in the project's development;
- to hand out participation certificates.

Project evaluation

Survey analysis

During the projects' implementation, there were two surveys with 165 students among a total of 181.

It was verified that, from the beginning until the end of the project, children who had an Average Body Mass Index above the recommended values, reduced their index (a 14% reduction in girls and 5% in boys). In the same way, the ones that were under the aver-

age, increased their BMI (a 5% increase in girls and 4% in boys). The surveys also showed some changes in eating behaviours: more than 50% are aware of the right number of daily meals; the number of children having breakfast increased; the consumption of fruit has also increased from two pieces a day to 3 pieces of fruit a day.

Children's testimony

According to the information gathered in the surveys, children's opinion about the project is very positive. What most captivated them was the completion of the game through stickers, followed by illustrations / appearance of materials and mascots.

Teacher's testimony

The notes collected in the teachers' diaries enabled the observation that children have joined the project, demonstrating interest and motivation for completing the food diary. Children got information that consolidated and expanded their knowledge of a balanced nutrition, the food wheel, among other things, and committed them to a healthy daily life, enabling them to correct their mistakes and to be more careful with their behaviour and food choices.

In teachers' opinion, the food diary is a compelling educational material, with bright colours and interesting mascots, endowed with diverse information about the importance of healthy eating, physical exercise, among others.

Simultaneously, the activity allowed teachers to be aware of their students' diet quality. One of the teachers found out, for example, that more than 50% of the class used to eat healthier food when they had lunch in school than in their home meals.

On the other hand, they also witnessed some revealing moments of the effectiveness of the project in spreading the message:

- A parent went to school, to expose his dissatisfaction with the child's refusal to eat a birthday cake, deemed to be unhealthy;
- Some parents also reported that at home children refused to eat certain foods less healthy and even motivated their brothers to adopt the same attitude;
- Other educators also reported a spontaneous event, in which a group of children refused to eat the fries served to them at lunch.

Conclusions

From the data gathered in the schools where the project was trialled, its results were very positive. As a result, its promoters in-

tend to continue with its implementation and widen its reach . Changes children's eating behaviours were effective and, according to teachers, their knowledge of the requirements for a healthy daily life were greatly enhanced. As evidence of this conclusion are the Class Dashboards, documenting the performance of children during the activity. Teachers' testimonies about contacts with parents and other educators bring to light stories of children who refused to eat cakes or chips on account of being unhealthy, and undertook as their mission to encourage their own families to improve eating habits. To achieve a sustainable change in lifestyles, is compelling to interact with the community widening the scope for manoeuvre of the project and pouring the school environment.

In order to achieve a real and sustainable change in lifestyles, it is pressing to promote a broader interaction with the community, widening the project's scope of action and exceeding the school's space. To increase awareness, family oriented actions with both a strong practical component and a high conviviality spirit must be designed and implemented.

To summarise, what is proposed for further developments is a stronger commitment with the co-design methodology, more community involvement and a better use of the surrounding environment – which comprises the urban space, existing social structures and local businesses – through a better paced programme, aiming at better motivating its recipients.

Also, it must be highlighted that if the goal is to motivate families to change their eating habits, there have to be mechanisms in place to support the less well equipped and more vulnerable ones in this endeavour. In this sense, the activities proposed and carried out in the school's context of these projects may help the competent authorities to pinpoint cases in which such support is necessary.

In tandem with this growing community involvement , and considering some of the case studies analysed, children's exposure to the reality of growing their own fresh vegetables and preparing their own healthy meals appears to be a winning bet, both in educational and emotional terms. As such, it would be very interesting to invest further in introducing cooking lessons and urban vegetable gardens.

Judging from the results obtained in this pilot project, it is believed that its extension to the whole of the school system could prove to be a highly effective way of countering the problem of childhood obesity rooted in bad eating habits and lack of knowledge on the benefits of a healthy food diet.

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